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ON THE AFFINITIES OF THE GENUS TACHYCELLUS, WITH DESCRIPTIONS OF NEW SPECIES FROM THE WESTERN UNITED STATES.

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The first reference to the genus *Tachycellus* in our literature was made by LeConte in his "Notes on the Species of *Agonoderus*, *Bradycellus* and *Stenolophus* Inhabiting America North of Mexico." * In this paper, which was prompted by one on North American Carabidæ by Chaudoir, † LeConte declares himself not ready to follow the French author in referring certain of our species to *Tachycellus* Moraw., which species he retains as Group A of *Bradycellus*, as follows :

dichrous Dej.
vulpeculus Say.
autumnalis Say.

badiipennis Hald.
atrimedius Say.
nebul sus Lec.
nigrinus Dej.
tibialis Kirby.

In his Genera of Carabidæ (1881), Dr. Horn admits the validity of *Tachycellus* for the species of the second column above, and transfers those of the first column to *Harpalus*. Two years later Horn gives in the Brooklyn Bulletin ‡ a synoptic table of *Tachycellus*, in

*Proc. Acad. Nat. Sci. Phila., 1868, p. 373.

† Revue et Mag. de Zoologie, 1868.

‡ Bull. Brook. Ent. Soc., VI, 1883, p. 51.

which the species stand precisely as now recorded in the Henshaw list, viz.:

nigrinus Dej.

kirbyi Horn.

atrimedius Say.

nebulosus Hald.

badiipennis Hald.

nitidus Lec.

In this treatment of the genus, *tibialis* is made a synonym of *nigrinus*, *nitidus* (withdrawn from LeConte's Group B of *Bradycellus*) is admitted, and *kirbyi* is new, the brief tabular characters serving for its description.

The sole criterion offered by the "Classification" for the distinction of *Tachycellus* from *Bradycellus* lies in the number of glabrous joints of the antennæ, these being three in the former, and two only in the latter genus. This character is assumed to be constant, but investigation shows that it is not strictly true of *nigrinus*, in which the third joint is clothed somewhat sparsely in its apical half with the same kind of pubescence as the following joints. The same condition exists in a second species—*turbatus*—to be described in the present paper. Another character of importance, mentioned by LeConte and Horn, is the presence of squamules on the lower surface of the middle tarsi in *Tachycellus* (except *nitidus*), and the absence of such squamules in *Bradycellus* (except *linearis*). The two exceptions named were each made the type of a distinct genus (*Glycerius* and *Amerinus*) by Casey in 1884, both of which were shortly after repudiated by Horn. The characters used by Casey seem, it is true, of somewhat trifling moment, but the elimination of these two aberrant forms at least possessed the merit of leaving *Bradycellus* and *Tachycellus* more homogeneous, and separable by one constant character. I have not seen Morawitz's description of *Tachycellus*, but from the remarks of subsequent authors it seems clear that he based the genus chiefly upon the tarsal character above named, and laid little if any stress upon the number of glabrous joints of the antennæ, which for aught I know he may not have mentioned at all. At all events they are not alluded to by Seidlitz in his *Fauna Transylvanica*, nor does Ganglbauer use the character in his more recent masterly treatment of the Käfer von Mitteleuropa. The latest European Catalogue—that of Heyden, Reitter and Weise—follows Seidlitz, who characterizes the genus thus:

Tarsi above and eyes hairy; mentum toothed, scutellar stria rarely present; prosternum not margined in front, hind tarsi not grooved; male with a more densely punctured and pubescent spot on the abdomen, just back of the hind coxæ, and with the front tarsi furnished beneath with two rows of squamules.

As thus constituted the genus includes *cognatus* Gyll — placed as a *Bradycellus* in our lists — and several allied forms, all of which Ganglbauer has properly transferred to *Dichirotrichus* Duval on the basis of the presence of a seta in the hind angle of the prothorax, creating for them the subgenus *Trichocellus*, typical *Dichirotrichus* having the male front tarsi pilose rather than squamulose beneath, and the upper surface of the body conspicuously pubescent and rather closely punctured throughout. The latter author regards *Tachycellus* as merely a subgenus of *Bradycellus*, separable by its squamose middle male tarsi, these being simple in the true *Bradycellus*; a single small species (*similis* Dej.) is referred to it.

What now is the bearing of this upon the disposition of our own species? The interpretation of Seidlitz is totally different from that of either Le Conte or Horn, and would exclude all the species we now refer to the genus, substituting for them *cognatus* alone. The view of Ganglbauer is more nearly in accord with that of our own authors, and if we reverse in order of importance the antennal and tarsal characters, the desirability of which is indicated above from a study of our own species, the two become practically identical. The question as to whether the differences in the modification of the male tarsi are to be regarded as of generic or subgeneric import is of course a matter of opinion; Ganglbauer holds the latter view; I am inclined to the former. Such characters are commonly held to be of rather more than ordinary importance, and are almost invariably associated with others which, if somewhat trivial in themselves, assume an added importance in conjunction with the former; moreover, in the present case, clearness of exposition is certainly facilitated thereby.

Let us pass briefly in review the species of *Tachycellus* as they now stand in the Henshaw list. It is first necessary to remove *nebulosus*. An examination of the LeConte type during a recent visit to Cambridge shows it to be a typical *Bradycellus*, closely resembling and probably not distinct from *rupestris*. *Nitidus* is a very aberrant form and cannot be retained in the genus, the only reason for so associating it being the nearly glabrous third joint of the antennæ. It is more nearly related to *Bradycellus*, but does not properly enter there and the proper course would seem to be to restore Casey's genus *Glycerius* for this and several allied forms to be herein described.

The remaining species agree in possessing the fundamental tarsal characters of the genus, and all, with the exception of *nigrinus*, have

the finer pubescence of the antennæ beginning on the fourth joint. *Badiipennis*, in its rounded posterior thoracic angles, departs somewhat in facies from the other three. Regarding these four species together with two undescribed forms in my collection as exponents of the genus, the latter may be characterized as follows :

Genus **TACHYCELLUS** Morawitz.

Penultimate joint of labial palpi not longer than the terminal joint and bisetose in front; front and middle tarsi of males with two rows of squamules beneath, the former moderately, the latter (except rarely) feebly or scarcely dilated, the fourth joint emarginate; mentum toothed; finer pubescence of the antennæ commonly beginning on the fourth joint, more rarely at the middle of the third; body throughout glabrous; side margin of prothorax with a single seta before the middle; elytra normally striate and with a single dorsal puncture; prosternum non-setose at tip; abdomen without pubescent spot in the male.

TABLE OF SPECIES.

Antennæ with three glabrous joints.

Hind angles of thorax sharply defined and nearly rectangular.

Legs pale.

Prothorax testaceous, with large piceous spot; width at base not greater than the length.....*atrimecius*.

Prothorax piceous, marginal bead alone paler; width at base a little greater than its length.....*kirbyi*.

Legs piceous, the tibiæ paler at base.....*conformis*.

Hind angles of thorax obtuse, rounded.....*badiipennis*.

Antennæ with two glabrous joints, the third pubescent in outer half, though less conspicuously so than the following joints.

Hind angles of thorax rectangular, middle tarsi scarcely dilated in the ♂.

nigrinus.

Hind angles of thorax obtuse, scarcely rounded; middle tarsi of male nearly as widely dilated as the front tarsi.....*turbatus*.

T. atrime dius Say, Trans. Am. Philos. Soc., II (1823), p. 39.

"Length 7 mm. Black; prothorax and elytra testaceous, the former with a large quadrate black spot, the latter with a dusky cloud divided by the suture; body slender; prothorax distinctly narrowed behind; hind angles subrectangular, slightly prominent, not rounded; basal impressions broad, punctured; antennæ with joints 1-3 testaceous, legs testaceous." (LeConte's description.)

Occurs from New England and Canada to Texas. Always easily recognizable by its coloration.

T. kirbyi Horn, Bull. Brook. Ent. Soc. VI (1883), p. 51.

Length 6 mm. Blackish, the elytra gradually becoming castaneous or piceo-castaneous toward the base and sides; epipleuræ, marginal bead of thorax, legs, and basal three joints of antennæ paler. Prothorax moderately narrowed behind, the

length rather less than the width at base; basal impressions broad and moderately deep, thickly punctured.

“Canada and Ohio.”

At once distinguishable by its stouter form and darker color from the more common *atrimedius*, the only other species with sharply defined posterior thoracic angles occurring in the same region.

T. conformis, new species.

Length 6.5 mm. Black, shining, basal joint of antennæ pale; legs piceous, the tibiae, especially at base, somewhat paler. Prothorax distinctly narrowed behind, slightly wider at base than long at the middle; hind angles nearly right; basal impressions broad, very finely and quite sparsely punctate; elytra finely striate.

Washington and California.

Described from a single female specimen from Washington (State), sent me years ago as *nigrinus*. As compared with *nigrinus* it is larger, the thorax more narrowed behind, basal impressions widely punctate (nearly or quite impunctate in *nigrinus*), third joint of antennæ glabrous, elytra more finely striate.

The latter locality — California — is represented by several examples taken by Dr. Fenyès at Pt. Reyes. There is also an example in the LeConte collection, the specimen being placed with *nigrinus*.

T. badiipennis Hald., Proc. Acad. Nat. Sci. Phila., I (1883), p. 302.

“Length 5–6 mm. Blackish; bead of prothorax pale; elytra piceous or dark testaceous; body more slender; prothorax distinctly narrowed behind; hind angles obtuse, rounded; basal impressions well marked, sparsely punctured; legs ferruginous, thighs and tips of tibiae sometimes darker; first joint of antennæ pale.” (LeConte’s description.)

This species ranges from New England and Canada to Virginia and Kansas.

T. nigrinus Dej., Spec. IV (1829), p. 39.

“Length 5.5–6.5 mm. Black, shining, not iridescent; prothorax with hind angles rectangular; basal impressions linear, strongly marked, smooth, or scarcely punctured; anterior transverse impressions distinct, strongly angulated; upper part of tibiae and first joint of antennæ testaceous.” (LeConte’s description.)

Alaska, Lake Superior, New Mexico (Beulah), Northern California (McLond, Fenyès).

The prothorax is less narrowed posteriorly than in any of our other species.

T. turbatus, new species.

Robust, feebly convex, piceous black with very faint greenish surface lustre, marginal bead of prothorax, legs, and antennæ pale. Antennæ a little less than half

the length of the body, rather more slender than in *badiipennis*; pubescence beginning at the middle of the third joint. Prothorax moderately transverse, widest before the middle; sides arcuately converging to base which is slightly wider than the apex; base angles obtuse, scarcely rounded; median line fine and complete; basal impressions broad with about eight minute punctures at the bottom of each impression. Surface otherwise impunctate. Elytra two fifths wider than the prothorax and seven tenths as wide as long; striae fine, impunctate, intervals flat; apex rather strongly sinuate. Front and middle tarsi broadly dilated in the male, the fourth joint emarginate. Length 5.5 mm., width 2.5 mm.

New Mexico.

Described from two examples (♂♀) collected at Beulah (8,000 ft.), and Cloudercroft (9,000 ft.) by Cockerell and Knaus respectively.

As the genera are at present defined this species will prove a disturbing element wherever placed. The third joint of the antennæ being pubescent in apical half would, strictly speaking, exclude it from *Tachycellus*, but the same is true of *nigrinus* which has long occupied a place in the genus. The middle tarsi are nearly as widely dilated as the front ones in the male of *turbatus*, but much less so in typical *Tachycellus*. *Turbatus* cannot, however, be included in *Stenolophus* because of the toothed mentum and non-bilobed fourth tarsal joint, nor can it be referred to *Bradycellus* because of the squamose intermediate male tarsi. Of the species now referred to *Tachycellus*, *turbatus* most resembles *badiipennis*, though distinctly more robust.

Genus GLYCERIUS Casey.

This genus was established by Casey for the *Acupalpus nitidus* of Dejean, subsequently referred to *Bradycellus* by Mannerheim and LeConte, and to *Tachycellus* by Horn. The species represent a well marked type, differing conspicuously in facies and in combination of structural details from any of the genera with which it has been associated, and notwithstanding its rejection by Horn, the genus appears to me to be well founded. In Casey's short diagnosis much stress is laid upon the numerous marginal setæ of the prothorax. The character is indeed a remarkable one but it possesses absolutely no weight from a generic standpoint, there being only the normal single seta each side in each of the new species described below, all of which are certainly congeneric with *nitidus*. Briefly the principal characters of the genus are as follows:

Mentum toothed; front tarsi (♂) rather feebly dilated and biseriately squamulose, middle tarsi undilated and without squamules; antennæ with three glabrous

joints; scutellum short and broad, only feebly entering the elytral disk; upper surface glabrous, polished; elytra with the sutural stria alone impressed, the others feeble or completely effaced; dorsal punctures wanting; lower surface sparsely punctured and pubescent, tip of prosternum plurisetose, abdomen in the male with two small densely punctured and pubescent spots (sometimes confluent) on the second and third segments.

TABLE OF SPECIES.

Prothorax at sides plurisetose; size large (5-7 mm.) color usually entirely or in great part testaceous.....**nitidus**.

Prothorax at sides unisetose, color piceous, usually more or less bronzed, rarely obscurely suffused with testaceous.

Hind angles of prothorax rectangular or very nearly so, abdominal pubescent spots in the ♂ well separated; size smaller (3.5-5 mm.).....**politus**.

Hind angles of prothorax obtuse, the prothorax more distinctly narrowed posteriorly; abdominal pubescent spots in the male confluent; size small.

Sides of prothorax slightly sinuate before the hind angles, the latter more sharply defined; elytra three times as long as the prothorax.

intermedius.

Sides of prothorax scarcely visibly sinuate before the angles, which are less sharply defined; elytra two and one half times as long as the prothorax.

obtusus.

G. nitidus Dej.

This is our largest species and may always be recognized by the numerous marginal setæ of the prothorax. These setæ are about seven in number and more closely placed in front; there is no seta in the hind angle. The color in California specimens is commonly entirely testaceous, but specimens are frequently seen having two elongate discal spots on the thorax, and a discal stripe on the elytra black. The black color is inclined to spread by diffusion, but I have never seen specimens from our territory with either thorax or elytra entirely dark. In a series of Mexican specimens before me the elytra are entirely black in some specimens while in others the entire upper surface is thus suffused. These are the *obsoletus* of Say. As observed by Bates in the *Biologia*, the form in the Mexican specimens seems a little more elongate than in those from California, but the difference is elusive and it is probable that Horn was correct in declaring them identical. The elytral striæ except the sutural, which is always sharply impressed, are very variable. Commonly there are faint traces of one or more discal striæ and occasionally these are all discernible; in many specimens however they are completely effaced. The pubescent spots of the second and third segments are very small and separated by a distance rather greater than their own diameter.

The species ranges from British Columbia to Lower California and far into Mexico.

G. politus, new species.

Similar in form to *nitidus* but smaller. Body entirely black, highly polished above, usually with distinct greenish tinge; rarely obscurely suffused with testaceous, especially toward the base of the elytra; legs and base of antennæ testaceous. Prothorax rather feebly narrowed posteriorly, the sides sinuate before the hind angles which are nearly right. Sides with a single marginal seta just before the apical third; basal impressions rather broad and with a few punctures. Elytral striae except the sutural, faint or obliterated. Lower surface except the prosternal side pieces sparsely punctate, each puncture bearing a short hair; ventral surface finely but distinctly alutaceous, shining; pubescent spots in the male distinctly separated. Length 3.5 to 5 mm.

Oregon (The Dalles) to southern California. A rather common species which has hitherto been unaccountably confused with *nitidus*. It is evidently this species which Dr. Hamilton referred to as "the small form" in his Random Notes on Coleoptera (Ent. News, 1896, p. 291) where he says of *Tachycellus nitidus*, "Scarcely a species in the whole range of Coleoptera exhibits greater diversity among the individuals in size and color, varying from .14 to .28 inch in length and from bronzed black to testaceous. According to Dr. Horn the small form which is the black one is usually the male, while the larger testaceous individuals are mostly females." It is needless to say that the statement quoted is entirely misleading.

G. intermedius, new species.

Black, highly polished, with distinct bronze or green bronze surface lustre; base of antennæ and legs pale. Prothorax more distinctly narrowed behind than in *politus*, sides slightly sinuate before the hind angles, which are plainly obtuse though sharply defined; basal impressions with very few fine punctures. Otherwise nearly as in *politus*. Length 4.2-4.5 mm.

California. Described from three females, two of which (the types) were taken by me in the San Bernardino Mts., the third by Dr. Fenyès at Lake Tahoe. It is assumed in the table that the abdominal pubescent spots are as in *obtusus*.

G. obtusus, new species.

Differs from *intermedius* in its more obtuse hind angles of the prothorax, the side margins not or scarcely sinuate before them; also in the relatively shorter elytra, as indicated in the table. The abdominal pubescent spots in the male are contiguous. Length 3.5-4 mm.

Southern California (Pasadena, Azusa, Claremont). Our smallest species. Thus far it has been taken only in the valleys at elevations

of 1,000 feet more or less, while *intermedius* has occurred only at elevations of 5,000 to 7,000 feet in the Sierras.

The Harpaline genera of our fauna allied to *Tachycellus*, viz., those which have the terminal joint of the labial palpus equal to or longer than the preceding, and the penultimate joint bisetose in front, may be tabulated as below. The claims of *Trichocellus*, *Glycerius* and *Amerinus* to rank as distinct genera cannot be finally settled until a thorough study of the Harpali of both the Nearctic and Palearctic regions has been made. For the present their use will facilitate a clearer expression of the mutual relations of our own species and this in itself is a sufficient reason for their acceptance pending the broader study.

TABLE OF GENERA.

Penultimate joint of anterior and middle tarsi of male bilobed, the middle tarsi dilated; prosternum plurisetose at tip; mentum not toothed..... **Stenolophus**.

Penultimate joint of anterior and middle tarsi simply emarginate, middle tarsi not or feebly dilated in the male (except *Tachycellus turbatus*).

Middle tarsi of ♂ biseriately squamulose..... **Tachycellus**.

Middle tarsi of ♂ without, or with but few (*Amerinus*) squamules beneath.

Body beneath sparsely punctured and pubescent, prosternum plurisetose at tip, antennæ with three glabrous joints, males with pubescent spot or spots at base of abdomen.

Upper surface completely glabrous, sutural stria of the elytra alone impressed, the others feebly indicated or completely effaced; dorsal punctures wanting; thorax without seta in posterior angle.

Glycerius.

Upper surface with sparse fine pubescence; elytra normally striate with the usual single dorsal puncture, hind angles with setigerous puncture..... **Trichocellus**,

Body beneath glabrous and impunctate (except the prothorax in *Amerinus*). prosternum bisetose or non-setose at tip; antennæ with two glabrous joints, males without pubescent spot at base of abdomen.

Mentum toothed, elytra with a single dorsal puncture, prosternum non-setose at tip.

Middle tarsi of ♂ without trace of squamules beneath, tooth of mentum much shorter than the lateral lobes, elytra feebly sinuate at tip **Bradycellus**.

Middle tarsi of ♂ with a few squamules beneath, tooth of mentum as long as the lateral lobes, elytra strongly sinuato truncate at apex. **Amerinus**.

Mentum not toothed, elytra frequently with several dorsal punctures, posternum either bisetose or non-setose at tip..... **Acupalpus**.

The number of setæ at the tip of the prosternum is a somewhat useful character, being constant throughout each genus except *Acu-*

palpus, and entirely independent of sex ; there is also, as in numerous other Carabide genera, some variation in the number of anal setigerous punctures. These variations are indicated categorically below :

Stenolophus. — Prosternum plurisetose at tip ; anal setæ variable. In the majority of species there are two each side in both sexes but in several species there is but one each side in the male.

Tachycellus. — Prosternum plurisetose at tip ; anal setæ one each side in the male and two in the female, except *turbatus*, in which there are two each side in both sexes.

Glycerius. — Prosternum plurisetose at tip ; anal setæ two each side in both sexes of *nitidus*, but in all the other species there is one each side in the male and two in the female.

Trichocellus. — Prosternum plurisetose ; anal setæ one each side in the male and two in the female. Our only representative is the common *cognatus*, widely dispersed over the northern part of both continents ; there are several allied species in Europe.

Bradycellus. — Prosternum without setæ ; anal setæ two each side in both sexes.

Amerinus. — Prosternal and anal setæ as in *Bradycellus* except that the interior anal setæ are not marginal.

Our only species is *Bradycellus linearis* of LeConte. The species is a very peculiar one and besides the tabular characters differs from all our species of *Bradycellus* in its relatively small eyes and long mandibles, sculpture, wider marginal bead of prothorax, the upper surface of which is deeply sculptured and the lower surface sparsely rather coarsely punctate.

Acupalpus. — Prosternum bisetose at tip in those species with several dorsal punctures on the elytra ; non-setose in those with a single dorsal puncture. Anal setæ one each side in the male and two in the female.